

CLAIMS

What is claimed is:

1. A molded device, comprising:
a co-extruded multilayer film, including at least:
a color layer; and
a bulk layer joined to the color layer; and
a foam layer bonded to the bulk layer of the multilayer film;
wherein the film and the foam layer together operably form a structural unit.
2. The device of Claim 1, comprising:
a clear layer bonded to the color layer opposite to the bulk layer;
wherein the clear layer is operably formed of a polymeric material.
3. The device of Claim 2, comprising a backing layer joined to the bulk layer opposite from the color layer.
4. The device of Claim 3, wherein each of the color layer, the bulk layer, the backing layer and the foam layer comprise a polymeric material.
5. The device of Claim 4, wherein the polymeric material of the foam layer comprises a polyethylene material.

6. The device of Claim 4, wherein the polymeric material of the foam layer comprises at least one of polyurethane, polyethylene, polypropylene, polyester, polycarbonate/ polyester alloy, ethylene vinyl acetate copolymer, amide, ionomer, polycarbonate, acrylonitrile butadiene styrene, polybutylene terephthalate, thermoplastic olefin, thermoplastic elastomer, polyethylene terephthalate, polyethylene terephthalate copolymer with glycol, acetyl, and/or polyphenylene oxide.

7. The device of Claim 5, wherein the polymeric material of the foam layer further comprises a blowing agent.

8. The device of Claim 6, wherein the polymeric material of the foam layer further comprises a blowing agent.

9. The device of Claim 1, wherein the multilayer film comprises a thickness ranging from approximately 0.30 mm to approximately 1.25 mm.

10. The device of Claim 1, wherein the multilayer film comprises a nominal thickness of approximately 0.76 mm.

11. A method for forming a multilayered polymeric component,
comprising:
 - coextruding a film layer using the steps of:
 - forming a color layer; and
 - binding the color layer to a bulk layer;
 - thermoforming the film layer;
 - positioning the thermoformed film layer in a mold of a molding machine; and
 - bonding a foam layer in the mold to the thermoformed film layer.
12. The method of Claim 11, comprising joining the bulk layer to a backing layer prior to bonding the foam layer.
13. The method of Claim 11, comprising forming the film layer from at least one polymeric material.
14. The method of Claim 13, comprising:
 - pre-cooling a thermoforming mold prior to the thermoforming step;
 - and
 - pre-heating the film layer prior to the thermoforming step.
15. The method of Claim 11, comprising fusing the foam layer to the bulk layer during the bonding step.

16. The method of Claim 11, comprising applying an adhesive between the foam layer and the bulk layer during the bonding step.

17. The method of Claim 11, comprising overcoating a side of the color layer opposite to the bulk layer with a clear layer prior to the thermoforming step.

18. The method of Claim 11, comprising injection molding the foam layer.

19. The method of Claim 11, comprising extrusion molding the foam layer.

20. A process for molding a vehicle component part, comprising:
creating a polymeric film;
thermoforming the polymeric film into a predetermined shape;
positioning the predetermined shape in an injection mold; and
injecting a preheated foam mixture into the mold to operably bond
the foam mixture to the polymeric film.


21. The process of Claim 20, comprising molding the polymeric film
using the steps of:
forming a color layer;
overcoating the color layer with a clear layer on a first face of the
color layer; and
binding a second face of the color layer to a bulk layer.

22. The method of Claim 21, comprising:
joining the bulk layer to a backing layer; and
bonding the foam mixture to the backing layer opposite to the bulk
layer.

23. The process of Claim 20, comprising combining a polymeric resin
and a foaming agent to operably form the foam mixture.

24. The process of Claim 23, comprising:
preheating the foam mixture in an injection molding machine; and
injecting the foam mixture using the injection molding machine.
25. The process of Claim 23, comprising:
preheating the foam mixture in an extrusion molding machine; and
extruding the foam mixture using the extrusion molding machine.
26. The process of Claim 20, comprising pre-cooling a thermoforming mold prior to the thermoforming step.
27. The process of Claim 26, comprising:
preheating the polymeric film prior to the thermoforming step; and
positioning the preheated polymeric film in contact with the pre-cooled thermoforming mold.
28. The process of Claim 20, comprising forming the injection mold of an aluminum material.

29. A method for forming a multilayered polymeric component, comprising:
- simultaneously coextruding a multiple element film having at least a color layer, a bulk layer and a foam layer, including the steps of:
 - binding the color layer to the bulk layer; and
 - bonding a foam layer to the bulk layer opposite to the color layer;
 - sequentially transferring the multiple element film to a thermoforming device; and
 - thermoforming the multiple element film to operably form a completed part.
30. The method of Claim 28, comprising:
- forming a mold having the completed part shape; and
 - pre-cooling the mold to one of an ambient and a sub-ambient temperature.

31. A process for molding a component, comprising: 
coextruding a multiple layer polymeric film having at least
a color layer and a bulk layer;
forming a foam sheet;
bonding the foam sheet to the bulk layer to operably form a sub-
component;
transferring the sub-component to a thermoforming device; and
thermoforming the sub-component into a completed component.
32. The process of Claim 31, comprising controlling at least a density of
the foam sheet to operably permit bending of the foam sheet.
33. The process of Claim 32, comprising:
coiling the foam sheet after the forming step; and
un-coiling the foam sheet in preparation for the bonding step.
34. The process of Claim 33, comprising extrusion molding the foam
sheet from a polymeric base material and a blowing agent.
35. The process of Claim 31, comprising preheating the sub-
component prior to the thermoforming step.

36. The process of Claim 30, comprising pre-cooling a mold of the thermoforming device prior to the thermoforming step.